

## WILDLIFE MANAGEMENT UNIT 27 - PAUNSAUGUNT

### Boundary Description

**Kane and Garfield counties** - Boundary begins at highway US-89A and the Utah-Arizona state line; then north on US-89A to Highway US-89; then north on US-89 to Highway SR-12; then east on SR-12 to the Paria River; then south along the Paria River to the Arizona-Utah state line; then west along this state line to US-89A and beginning point.

### Winter Range Description

The Paunsaugunt wildlife management unit encompasses approximately 280,471 acres of summer range and 205,284 acres of winter range for deer, of which only 26% and 7% respectively occurs on private land. The vast majority of the winter range in the unit (85%) is managed by the Bureau of Land Management, while most of the summer range falls under Forest Service administration (40%), private land holdings (26%), and the Bureau of Land Management (25%). The Paunsaugunt Plateau provides the bulk of the summer range in the unit with an average elevation of 9,000 feet. The southern rim of the plateau is delineated by the Pink Cliffs of Bryce Canyon National Park and the Sunset Cliffs to the west. Terrain of the transitional and/or winter range is characterized by gently sloping terraces interspersed by extensive cliff formations. The Skutumpah Terrace lies between the Pink Cliffs and White Cliffs; the Wygaret Terrace, Nephi Pasture, and No Man's Mesa lie between the White and Vermillion Cliffs. The bulk of the winter range is found on the Wygaret Terrace.

### Key Areas

The key areas that have been identified on the summer range are the mixed mountain brush community in the upper reaches of Proctor Canyon, a high elevation black sagebrush-grass community between Ahlstrom Hollow and Johnson Bench, the ponderosa pine type on Whiteman Bench, the conifer clear-cut with its associated aspen resurgence below the Sunset Cliffs near Sand Pass, and the grass meadow type in Podunk Creek. Three studies were established in 1987 on deer winter range which are all on BLM land. Sagebrush is the dominant vegetation type on the two Nephi Pasture sites, and black sagebrush predominates on the Five Mile Mountain study site. An additional 5 study sites were established in 1997 to include important areas previously missed by trend studies. These include critical winter ranges on the south end of the unit on Buckskin Mountain, Telegraph Flat, and Crocodile. Two additional sites at Moon's Landing and Heaton, on the west side of the unit, sample mountain brush and sagebrush/bitterbrush transitional ranges at around 8,000 feet. In 1998, trend studies were established at several exclosures in the unit to determine differences in grazing treatments. These studies are found at the exclosure complexes in Nephi Pasture and John R. Flat. Both of these areas are important deer wintering areas.

### Livestock Grazing

**Grazing information from the 1997 report has been retained here. This information was current in 1997 but specific dates and AUM's may have changed since.**

Trend studies on Whiteman Bench and Podunk Creek lie within the East Fork C & H allotment which is managed by the Powell Ranger District, Dixie National Forest. This allotment has been grazed by domestic livestock since Panguitch Valley was settled in 1866. Use was extremely heavy by both cattle and sheep. The East Fork bottom land was the most productive and consequently received the most use. Streams were degraded and riparian vegetation was eliminated. In 1960, the permittees and Forest Service signed a Range Improvement Agreement which called for a 25% reduction in AUMs and a Forest Service commitment to

perform watershed improvement and range revegetation work. The present grazing system was implemented in 1975 and involves a seven pasture combination deferred rotation system. A total of 443 cows, owned by 12 permittees, use the allotment from about June 16 to about October 5. The Whiteman Bench site is located in the Tropic Reservoir Unit which is grazed for only 5 days in late September. The Podunk Creek site is located in the Upper East Fork Unit which is grazed annually between the end of July to the end of August, depending on the rotation, with 443 head of cattle.

The Proctor Canyon site is located in the Hatch Cattle Allotment. Very heavy sheep use occurred in this area around 1900. By the 1920's, the range was seriously overgrazed causing the depletion of vegetation and soils. Grazing pressure was reduced in the 1930's. By 1943, all the sheep were removed and cattle numbers were reduced. Although range studies showed that the allotment was still over utilized during the 1950's, cattle numbers remained the same through 1964. Allotment boundary changes and reductions have resulted in a total of 45 head using the allotment for the June 16 to September 15 season. The allotment is split into two units, and a deferred- rotation system is in place. Proctor Canyon is grazed early one year (6/16 - 8/15) and then later the next year (7/16 - 9/15) to effect two grazing treatments; grazing at range readiness one year and at late plant flowering through seed ripe the second year. Although 9,648 acres are included in this allotment, only 571 are considered suitable range for livestock. The steeper slopes provide an abundance of browse forage for mule deer; and consequently, winter range does not appear to limit deer numbers on this portion of the unit. Concentrated use by livestock on the small more productive portions of the unit will limit their value as summer range habitat for wildlife, especially in periods of drought.

The Ahlstrom Hollow study site is located in the Blue Fly Allotment which is currently assigned for 190 cattle between June 10th to October 10th. This allotment has a similar grazing history to that of the previous two. Excessive use by sheep was followed by reductions, and then in 1962, cattle replaced the sheep. A 5 pasture deferred rotation system was in place from 1930 to 1962, then a 2 pasture rest rotation system was initiated. The trend study is located in the south pasture of this allotment.

The Sand Pass trend study is located in the Kanab Creek C & H Allotment. This allotment experienced similar patterns of use since the late 1800's. Sheep use was followed by cattle in the 1950's. A series of allotment boundary changes and livestock reductions have taken place. The current allotment boundary was established in 1962. A three-pasture deferred rotation system is currently in place which is grazed by 60 head of cattle annually from June 11 to October 10. The Sand Pass trend study is located in the upper Unit I which is grazed with a deferred rest rotation grazing plan.

The two Nephi Pasture study sites are located in the Vermillion-Nephi Pasture BLM Allotment. Prior to 1970, 210 cattle used the unit from mid-April to mid-September. Since 1970, the numbers have been reduced to 190 and the starting date delayed to June 1. No earlier records are available. However, as was the case for the entire herd unit, excessive use by sheep occurred. This lower elevation range was used as winter sheep range prior to 1950. The Nephi Pasture study sites currently are part of a 9 pasture deferred rotation grazing system that is grazed in the winter. The new study site at Telegraph Flat is also part of the Vermillion allotment. The Five Mile Mountain study site is also on BLM land and is grazed by cattle during the winter from November 1<sup>st</sup> to April 30<sup>th</sup> as part of a single pasture unit. The new site at Crocodile is within the Oak Springs allotment which receives summer use on a deferred rotation system. The Buckskin Mountain site, on the Arizona border, is part of the Mollies Nipple allotment which receives winter use.

#### Herd Unit Management Objectives

This unit was previously combined with the adjacent Kaiparowits unit. Together they made up herd unit 60 A&B. In 1992, herd unit boundaries were reevaluated with the Paunsaugunt unit being changed to unit 52. In 1996, unit boundaries were again reevaluated and elk and deer herd units combined. The current boundary

is unchanged from 1992, but the unit number was changed to 27. The most current management objectives are to achieve a target population size of 6,500 wintering deer with a post season buck to doe ratio of 35:100. Buck deer harvest is managed for a 5 year old average age. Management objectives for elk are to a target winter herd size of 200 elk with a post season bull cow ratio of 16 bulls to 100 cows with at least 8 of these bulls being 2 ½ years or older. Bull harvest is managed for an average age of 5-6 year old animals.

Fawn production was low on the unit prior to 1992 and had declined steadily since 1987. Low fawn numbers are a factor which limited deer numbers in the past on the unit (Gardiner 1983). Inadequate summer range seems to be the key factor limiting fawn production. This has been exacerbated by years of drought. The long period of heavy use by sheep during the early part of this century, has reduced the forb component on the summer ranges and consequently, the productivity of these ranges as fawning habitat. Another factor is the gradual domination of seral aspen stands by conifers. This has greatly impacted deer summer range. Habitat improvement efforts should be directed towards converting areas that have shown good potential for aspen and reestablish them to productive seral stage plant communities again and seeding these areas with herbaceous species. Grazing systems in place on summer ranges, i.e. deferred-rotation and rest-rotation with cattle only, will tend to favor the production of forbs which should constitute a habitat improvement in most areas. Since a low of 51 fawns/100 does was estimated in 1992, fawn production had increased to 74 fawns/100 does by the next season (1992-93). Over the next four seasons, the average fawn/doe ratio was 71 fawns/100 does. Additional information on deer and elk management objectives and trend information for big game can be found in the Division's Big Game annual reports and management plans.

#### Study Site Description

Eight study sites were originally established in 1987 and reread in 1992. These include five summer range study sites which occur on Forest Service land on the Paunsaugunt plateau. Three sites sample winter range on BLM administered land. During the 1997 season, 3 additional winter range sites were established at Buckskin Mountain (27-9), Telegraph Flat (27-10) and Crocodile (27-11). Two new study sites were also placed on transitional range on the west site of the unit at Moons Landing (27-12) and Heaton (27-13). In 1998, studies were placed in the enclosure complexes at Nephi Pasture and John R. Flat to study differences in grazing treatments in these areas.

## SUMMARY

### WILDLIFE MANAGEMENT UNIT 27 - PAUNSAUGUNT

The majority of range trends on the Paunsaugunt management unit are in a downward state in 2003. Of the 18 studies that were sampled in 2003, only 1 site had an upward trend in any category which occurred at Moons Landing where the browse trend was slightly up. All other trends in all categories were either stable or declining at all other study locations. The browse and herbaceous understory components were in the worst condition in 2003 as 14 sites had downward browse and herbaceous trends. Soil trends are declining on 10 sites and stable on 8 others.

The primary factors influencing downward browse trends include decreasing key browse densities and young recruitment, reduced vigor, and increased decadence. The key browse on most of the studies in the unit is composed primarily of big sagebrush and antelope bitterbrush, with black sagebrush and serviceberry being important on select sites. Big sagebrush is represented by 2 subspecies, the basin and Wyoming varieties. Big sagebrush and/or black sagebrush was sampled on 16 of the 18 studies in the unit in 2003, and of these, percent decadence increased on 11 sites, remained stable on 3 sites, and declined on only two. Young recruitment declined on 14 of the 16 sites where sagebrush was sampled in 2003. Bitterbrush was sampled on 12 studies in the unit, with decadence increasing on 10 of these and young recruitment declining on all 12.

Herbaceous trends are primarily determined on composition and the abundance of perennial species. In 2003, nested frequency values of perennial grasses and forbs declined on 15 sites and 10 sites respectively. Average cover of perennial grasses declined on 11 sites, remained stable on 4 others, and increased on 3 summer range locations (Proctor Canyon, Ahlstrom Hollow, and Sand Pass). Perennial forb cover declined on only 7 studies in 2003, remained stable on 5 sites, and increased at 6 locations, most of which were in the summer or transitional zones. The forb component often shows a larger magnitude of decline during drought years compared to perennial grasses, but in this unit the reverse was true in 2003. Cheatgrass brome was only sampled on 7 of the 18 sites prior to the 2003 reading. This species was moderately abundant on only 5 of these, and declined in nested frequency and average cover on 4 of the 5 sites in 2003. The only increase in cheatgrass was found at Fivemile Mountain.

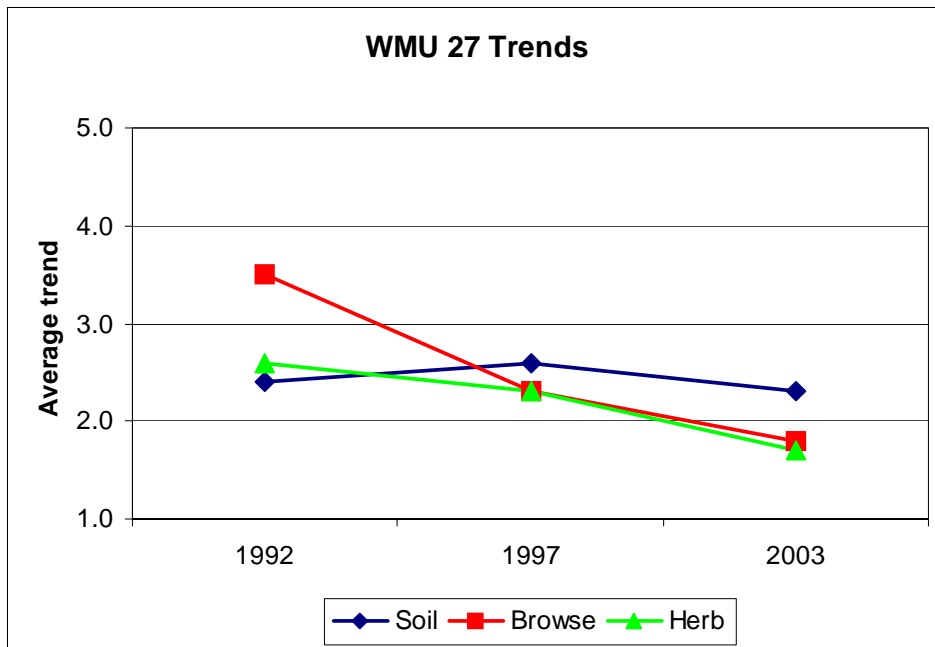
Downward soil trends occur when protective cover on the soil surface from vegetation, litter, and cryptogams declines. As bare ground increases, soils become more susceptible to erosion. Erosion condition class assessments were completed on each site in 2003 to determine the extent of erosive forces effecting a site. The most apparent changes on the soil surface in 2003 was an increase in bare ground on many areas, and a subsequent decline in one or more of the protective cover categories (vegetation, litter, and/or cryptogams).

Range trends are largely driven by precipitation. As a whole, Utah has been in a drought for the past 5 years, and southern Utah has been one of the driest area of the state during this period. Weather station data at 4 locations was analyzed to look at precipitation trends in the unit since range trend studies were established in 1987. These stations occur at Bryce Canyon National Park, Alton, Orderville, and Kanab (Utah Climate Summaries 2004). Precipitation data was averaged over the 4 weather stations listed above, and data indicate that from 1987-2002, total annual precipitation was below normal in 1988-89, 1991, 1994, 1999, and 2002 (see precipitation graphs below). Below normal precipitation in this discussion is defined as less than 90% of the normal average for a given area. Perhaps more important than total annual precipitation is seasonal distribution. Data were analyzed for both spring (April-June) and fall (September-November) totals. Spring precipitation is particularly important for cool season perennial grasses and forbs, as well as shrub populations, as these species initiate growth during the spring. Weather data indicate that spring precipitation in the Paunsaugunt unit was below normal in 1989, 1991, 1993, 1996, 2000, and 2002-03 (see precipitation graphs below). Fall precipitation totals have been normal or above normal in most years since 1987 with exception of 1988-89, 1992, 1995, 1999, and 2001 (see precipitation graphs below).

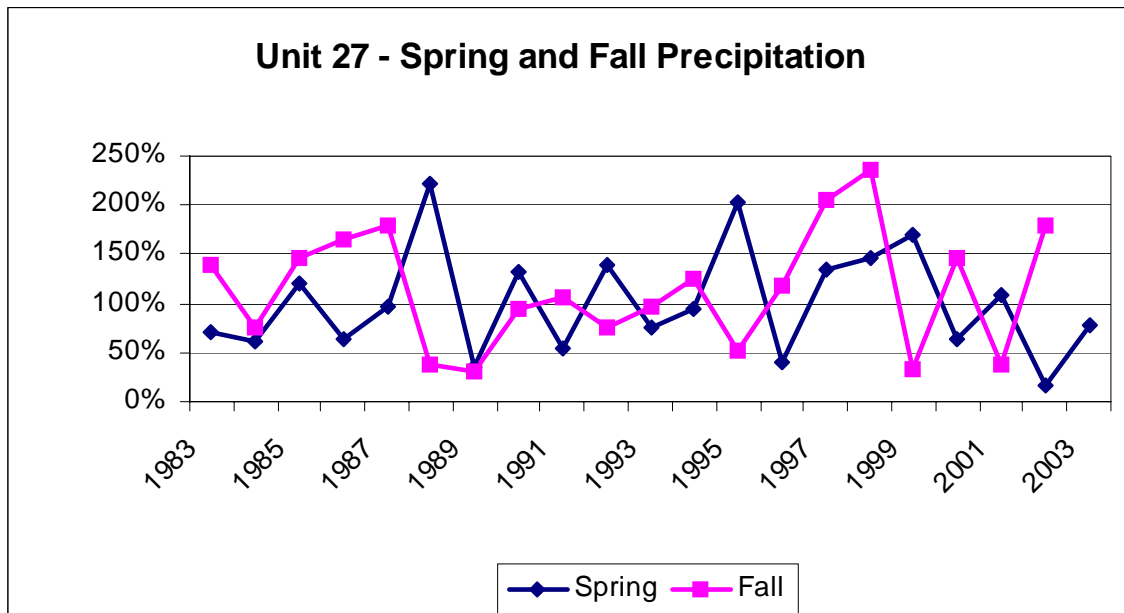
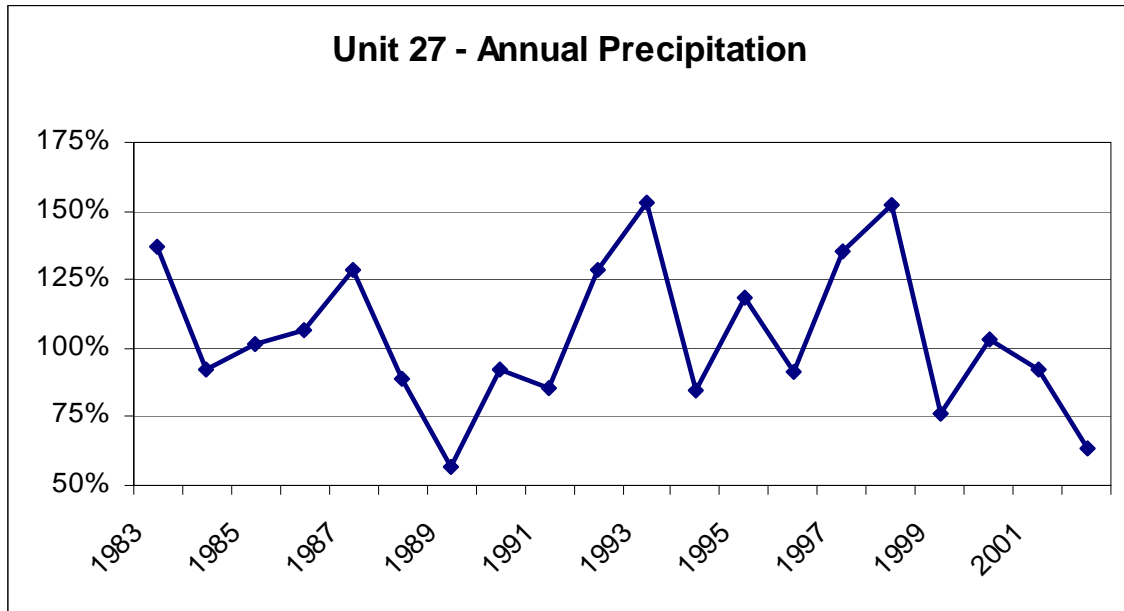
For this report, the period from 2000-present is the focus as it would most effect current range trends. Below normal spring precipitation in 2000 and 2002-03 is a primary reason for the decline in grasses and to some extent forbs in 2003, especially on lower elevation winter ranges. Without good spring precipitation, cool season perennials are not able to sustain high productivity as their primary growing season occurs during the spring and early summer. Big sagebrush populations on winter ranges were in particularly bad condition in 2003. Decadence levels were moderate to extreme at Nephi Pasture and John R. Flat as well as most other studies that sampled winter range. The dead age class also increased on many sites in 2003, and this trend may continue as several sites have a high proportion of decadent, dying plants. Declining young recruitment in sagebrush and bitterbrush populations is drought related and will continue until precipitation patterns improve.

#### Average Trends – WMU 27 Paunsaugunt

	1992	1997	2003
Soil	2.4	2.6	2.3
Browse	3.5	2.3	1.8
Herb	2.6	2.3	1.7
	8 sites	8 sites	18 sites



Precipitation graphs for the Paunsaugunt management unit. Data is percent of normal precipitation averaged for 4 weather stations at Bryce Canyon National Park, Alton, Orderville, and Kanab (Utah Climate Summaries 2004).



Trend Summary

	Category	1987	1992	1997	2003
27-1 Proctor Canyon	soil	est	2	2	3
	browse	est	4	2	3
	herbaceous understory	est	3	2	1
27-2 Ahlstrom Hollow	soil	est	2	4	2
	browse	est	5	3	2
	herbaceous understory	est	2	3	2
27-3 Whiteman Bench	soil	est	2	2	3
	browse	est	4	2	3
	herbaceous understory	est	3	1	2
27-4 Sand Pass	soil	est	2	2	3
	browse	est	4	3	3
	herbaceous understory	est	1	1	2
27-5 Podunk Creek	soil	est	3	3	2
	browse	est	3	4	1
	herbaceous understory	est	4	2	2
27-6 Nephi Pasture I	soil	est	1	3	2
	browse	est	2	1	1
	herbaceous understory	est	1	3	1
27-8 Fivemile Mountain	soil	est	3	2	3
	browse	est	3	1	1
	herbaceous understory	est	4	3	1

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up  
 (est) = established, (n/a) = no trend, (susp) = suspended, (NR) = not read

	Category	1997	2003
27-9 Buckskin Mountain	soil	est	3
	browse	est	2
	herbaceous understory	est	2
27-10 Telegraph Flat	soil	est	3
	browse	est	1
	herbaceous understory	est	1
27-11 Crocodile	soil	est	3
	browse	est	1
	herbaceous understory	est	1
27-12 Moons Landing	soil	est	2
	browse	est	4
	herbaceous understory	est	3
27-13 Heaton	soil	est	2
	browse	est	3
	herbaceous understory	est	1

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up  
(est) = established, (n/a) = no trend, (susp) = suspended, (NR) = not read



Trend Summary - Exclosures

	Category	1998	2003			
27R-1 John R. Flat Total Exclosure	soil	est	3			
	browse	est	1			
	herbaceous understory	est	3			
27R-2 John R. Flat Livestock Exclosure	soil	est	2			
	browse	est	1			
	herbaceous understory	est	3			
27R-3 John R. Flat Exclosure Outside	soil	est	2			
	browse	est	1			
	herbaceous understory	est	3			
27R-4 Nephi Pasture Total Exclosure	soil	est	1			
	browse	est	1			
	herbaceous understory	est	1			
27R-5 Nephi Pasture Livestock Exclosure	soil	est	1			
	browse	est	2			
	herbaceous understory	est	1			
	Category	1987	1992	1997	1998	2003
27-7 Nephi Pasture Exclosure Outside	soil	est	4	3	4	1
	browse	est	3	2	3	2
	herbaceous understory	est	3	3	3	1

(1) = down, (2), slightly down, (3) = stable, (4) = slightly up, (5) = up  
 (est) = established, (n/a) = no trend, (susp) = suspended, (NR) = not read